



# citizens' bulletin

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## RECYCLING

**lots of your trash shouldn't  
end up 'down in the dumps'**

### Inside

**RECYCLING:** Terms, 2; Whys & Wherefores, 3; How It's Working -- at a Successful Center, 4; And in Two Towns, 7; Environmental Review Teams, 8; Aquatic Winters, 10; 208 for 1979, 13; The Coast on the Move, 14; Land Use Workshops, 16; Taking Your Basements, 18; Water Resources, 19; Trailside Botanizing, 20.

# GLOSSARY

## Waste Words

### Recycling

Though it's often used to refer to a wider range of activities, DEP's solid waste specialists consider "recycling" as "the actual process of taking materials back into the manufacturing cycle." There are, however, different points at which materials can be pulled out of the "waste stream."

### Source Separation

Or "separation at the source," refers to the separation out of waste materials -- like newspapers, bottles, or old clothes -- at the household level or other point where they are generated, before they ever reach the garbage can or the landfill. At present, the greatest amount of "at the source" recycling is done by industry.

### Resource Recovery

At the opposite end of the recycling scale is "resource recovery." This refers to the high technology facilities which DEP's Charles Kurker calls the long-term solution to this State's dwindling landfill areas.

Connecticut's 1973 Solid Waste Management Plan, prepared by the General Electric Company in conjunction with the DEP, originally proposed ten resource recovery facilities. The number is now expected to be three or four since operating costs per ton of refuse drop in larger facilities. The first of these facilities, in Bridgeport, is now reaching mechanical completion, and it should be accepting solid waste by this July, Kurker says.

The Bridgeport recovery system is designed to process solid waste at the rate of 1800 tons per day. The processing facility is enclosed in a building over 100,000 square feet in size. The main product is a powdered fuel called ECO-FUEL II which will be burned, with oil, in two boilers at the United Illuminating Bridgeport Harbor Station power plant.

The process module contains two fuel lines, each capable of processing 75 tons of solid waste per hour. During this process the solid waste is reduced to small particles which then go through magnetic

separation to separate out ferrous metals. The remaining material is air classified to separate particles by density. The light fraction is further screened to produce ECO-FUEL II. Aluminum and glass, as well as ferrous metals, will also be separated out and marketed.

Facilities like Bridgeport's are designed to handle large volumes of waste -- it can handle 1800 tons per day with a surge capacity of 2200 tons per day.

Such large processing systems are costly. The bond issue for the Bridgeport system, which is currently proposed to serve nine cities and towns in Fairfield County, was \$53 million. This includes the main processing facility, six transfer stations, modifications that let the user accept ECO-FUEL II, rolling stock, and all engineering costs.

High initial costs of such systems are offset by the economy of scale. The following figures from the Bridgeport bond prospectus show clearly the effect on the tipping fee of the plant's reaching capacity: at 1200 tons per day, the estimated 1980 tipping fee will be \$17.44 per ton; at 1500 tons per day, \$14.73 per ton; at 1800 tons per day, \$11.15 per ton.

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Concerned about recycling? In most towns, the town clerk or town hall should be able to give you information about existing recycling programs. DEP's Solid Waste Unit (566-5847) can offer information and assistance to persons attempting to start recycling programs.

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## WASTE: THE THIRTY PERCENT SOLUTION

# Recycling cuts removal cost, saves space

Find it a little difficult to picture yourself pillaging, plundering, and laying waste to the countryside? Chances are you do your part.

Connecticut's citizens generate close to 10,000 tons per day (or 20,000,000 pounds) of "municipal wastes" -- conventional garbage and rubbish and household wastes mixed with some smaller amounts of bulky wastes and commercial or industrial wastes. Meaning the average person in the State throws away in the neighborhood of six pounds of materials a day.

The greater part, about ninety-three percent, of this waste goes to one or another of the State's 172 "sanitary landfills." So disposed of, much of this paper, cardboard, rags, glass, metal, wood, and waste oil is gone for good for all practical purposes.

"Ideally," according to Charles Kurker, Director of DEP's Solid Waste Management Unit, "you could remove about sixty-five percent of the municipal waste from the waste stream." This estimate, he says, is "idealistic," but he thinks at least thirty percent can be removed and recycled.

"This would be a big step in the right direction," says Kurker, who rides herd on the State's dwindling landfills and costly and complex resource recovery efforts.

"Some people have thought that at DEP we're pushing high technology solutions to Connecticut's waste management problems. Not so," says Kurker. "Our goals are, first of all, good source separation programs. Those materials that can't be diverted at the source can go to high technology systems."

"Even," Kurker says, "with the highest technology, there are major benefits to be had from effective 'source separation.'" The first, and the most persuasive of these, is reduction of immediate waste removal costs to communities. But there are also energy savings and reduction of some forms of air and groundwater pollution.

Calculating the value of a recycling program, Kurker says, should include as immediate savings the costs per ton of the tons of materials a town doesn't dump -- either in its own landfill or elsewhere -- at tipping fees of \$12 to \$18 or \$20 a ton. It should also count refuse transportation charges the town doesn't pay.

Towns with recycling programs can figure a plus for any money they make from selling recyclable materials -- minus transportation and handling charges. But they shouldn't, Kurker says, demand that their recycling programs show a monetary profit.

"Even if you get no revenue you're probably still ahead of the game," Kurker says, "because as you reduce your waste tonnage, you reduce your costs for disposal. The main interest should be in getting rid of the material -- even by taking a little loss."

"Unfortunately, municipalities have been reluctant to spend on recycling -- on trucks and payrolls. And they have been reluctant to make commitments -- to say 'we'll really get involved.' Scrap materials dealers," Kurker says, "look for commitments like local ordinances mandating the separating out of recyclables or contracts guaranteeing a certain level of supply of a material like paper."

Kurker favors encouraging private middlemen; "We don't care who gets the money if it saves space in the landfills." And DEP, he says, recommends regional approaches to recycling for the marketing advantages these offer. "A guaranteed supply of materials," Kurker says, "is the crux of the whole thing. Markets, for example, will supply storage containers and pickup service if you can guarantee a supply -- as well as giving you better prices."

Kurker leans toward municipal programs rather than volunteer efforts. Groups, he says, like churches and Scouts have tended to be "on and off" about their recycling programs. He's most enthusiastic about programs in a few towns that already provide curbside pickup of separated materials.

To give municipalities and citizens a better idea of the spectrum of costs involved in solid waste disposal, Paul Dion of DEP's Solid Waste Unit is currently doing research geared to putting a dollar value on landfill space.

At the same time, the Solid Waste Unit's Philip Wright is updating DEP's information on local recycling programs. Thus far, 133 of Connecticut's 169 towns have responded to his preliminary survey, with about seventy-six percent indicating that they have some active recycling.

## RECYCLING SUCCESS COMBINES COMMITMENT, IMAGINATION:

# "Keeping your eyes open is the basic thing."

Volunteer source separation, or recycling, programs face the greatest potential for problems. Besides other pitfalls like fluctuating markets and failure of the community to provide continuing supplies of materials, they often flounder because of loss of interest on the part of their volunteer help.

Nevertheless, one of Connecticut's oldest and most successful recycling programs is the private non-profit Recycling Center in Danbury, run by the Connecticut Earth Action Group, Inc. The secret of success, one gathers, is combining philosophical commitment with technical "smarts."

"It's irresponsible to throw away things," says Recycling Center manager Norman Cusack. And Danbury's Recycling Center goes far to make it easier not to throw things away.

One problem with profit-making recycling operations, Cusack points out, is that they have to stop taking materials for which there are no profitable markets. "We think you should also take things that don't pay," Cusack says. "'Does it help the environment?' is the question you should be asking."

With this question in mind, the Recycling Center takes one of the widest assortments of materials of any center around the State -- including the usual glass, cans, and papers. And Cusack constantly looks out for new recycling frontiers.

The Recycling Center, solicits, for example, clean unusable commercial wood pallets which it then offers to the public as free fire wood. Danbury now turns these away from its landfill and refers them to the Center. The program last year took in 800 cubic yards or about ten trailer loads of pallets. A word to local newspapers brought the takers.

On occasion, Cusack says, when the Center has received a batch of 5,000 or so books, "We get local radio stations to advertise a free book fair." Usable white glass light fixtures -- opaque glass is not recyclable -- were given to the local electrical store that helped the Center install lighting so users could drop off recyclables at night.

"We try to use things," Cusack says, "in the same state rather than at a lower value." So the Center saves and sells some

cartons. They give away rags to schools and garages for wipe cloths. (There is, Cusack says, almost no market for rags because of the contemporary use of mixtures of fibers.)

Reusable bags are given to non-food stores, and egg cartons go to farmers and food cooperatives. Center users are free to explore the scrap metal pile for washer parts or tanks for making wood stoves. Some young clients are growing adept at recycling old bicycle parts into working bicycles.

The philosophy of using things prevails at every turn. "We try to make everything in the Center out of recycled things," Cusack says. So the Center itself is a neat enclave of repainted old truck trailers -- "They practically give them away at \$100 or \$200, and you can sell them again when

## PAPER

One of Danbury's Recycling Center staff members loads newspapers. Paper makes up almost forty percent of the weight of municipal wastes and almost one-half their volume. With good recycling, paper fibers can be reused several times. Making pulp from recycled waste paper uses about one-quarter of the steam and one-tenth the electrical energy of virgin paper making. And fewer trees. Recycling does, however, require a significantly different technology from the making of virgin paper.

Paper is one of the most stable recyclables markets, though prices fluctuate with the seasons and with construction. At present, newsprint commands only about \$2 per ton and mixed papers \$1 to \$2 per ton. Right now, demand for paper is low and supply is great, but during the past three years the price paid for newsprint has been as high as \$50 a ton. Even now, steady suppliers command somewhat better prices.





## ALUMINUM

Aluminum cans, foil, pie plates and TV dinner trays are accepted by most recycling centers. Reynolds Aluminum Recycling Company's Mobile Unit will buy these from individuals for 17¢ a pound. Check cans with a magnet: if it adheres, the metal is not pure aluminum. The Mobile Unit, shown on our cover at Westfarms Mall, also makes regular stops at Charter Oak Mall, East Hartford; Tri-City Plaza in Vernon; and New London Mall. Call, toll free, 1-800-228-2525, for dates and times. Most recycling centers also take steel and bi-metal cans.



you're finished with them." The trailers are used as temporary buildings: for storage, for shelters for the Center's workers, and to hold recycled items and equipment.

The Center's three large glass bins are made of old utility poles. Cusack spotted a line company removing these along the roadside and offered to take all four hundred to six hundred of the 2,000 pound poles. The phone company sank eight tall corner poles for the bins as part of their community service program. And some of the poles were bartered to a local sawmill which sawed a group of poles into boards.

"Keeping your eyes open is the basic thing," says Cusack. "And having the guts to go out and scrounge. A lot of people don't want to do this." He adds, "Don't forget that most firms appreciate some publicity in return for their donations."

The Recycling Center's management continues to keep its eyes open. On the wintry day that Cusack showed off the Center, his next stop was a visit to Danbury's Federal Prison. Federal facilities are under directives, he points out, to seek out and participate in recycling programs. And the recyclable waste from an 800-inmate facility is worth seeking out. The Center already collects waste paper from Danbury's schools. For the future, the Center is also looking into working with area stores to be-

come a redemption center when the State's Bottle Bill takes effect.

Connecticut Earth Action Group (CEAG) got its start with Earth Day back in 1971. The credit for The Recycling Center's establishment goes, Cusack says, to dozens of people. Among these were CEAG president, Bill Swanson, and treasurer, Dave Krisch, and Cusack, the Center's manager.

The Center, which is open every day, now employs one full-time worker through a labor service and a half-time CETA worker and pays Cusack for his part-time work. As part of a policy of all-around community involvement, the Recycling Center also occasionally hires kids from a nearby housing project.

"We use our hands for most things. Most of our activities use a minimum of energy and a maximum of labor," Cusack says. But he's alert for ways to make every job easier -- like having a slippery table from which users or staff can sort papers directly and easily into barrels.

He stresses that the emphasis on manpower doesn't mean you can get away without equipment. Cusack tried to lend assistance to one other town's floundering recycling program where, he said, he found five CETA workers but no management and no equipment for them to work with.

## WASTE OIL



The public leaves waste crank case oil at the Danbury Recycling Center in containers and can take good empties from the other side of the bin. "Don't do it yourself" approach stops people from adding the wrong kinds of oils or even their anti-freeze. Ten other sites where you can dispose of waste oil are at landfills in Andover, Bloomfield, East Lyme, Glastonbury, Groton, Manchester, Southington, Tolland, Torrington, and West Hartford.

While he keeps an eye open for good recyclable equipment, Cusack suggests that recycling programs should carefully consider factors such as interest costs, maintenance, the possibility of vandalism and misuse of equipment -- the citizen who throws his garbage into the paper baler, for example -- as well as the general tendency toward "cantankerousness" of machinery. The Center's compacter, for one example, had to be phased out when the corrugated paper market disappeared.

Keeping a recycling center neat is important: "Once you let it begin to get sloppy, people are more likely to add to the mess."

Supervision of the Center is even more critical. Glass recycling is the area where, along with proper containers, quality control makes the biggest difference. Combustible materials like plastic labels and paper cause no problems, but stones or dirt and concrete chips from bins and metal tops or lids and mis-sorted glass can spoil whole batches of glass. Since Dayville's Glass Container Corporation, the only glass market in Connecticut, now uses fifty percent recycled materials in its glass mixtures, they look critically at quality. Each truckload is run through three inspections.

Prices for contaminated loads drop \$10 or more a ton. Really bad loads may be rejected completely. But despite the lower price, trucking charges remain the same, Cusack points out to the budget-minded.

At Danbury's Recycling Center, the public sorts into 4' x 4' boxes. Center workers sort from there into the 16' x 24' bins, rechecking for metals and color. The workers also go into the bins daily for an additional check.

Danbury's Center receives glass and cans from five other area towns' recycling programs, paying those towns for their materials. Resulting larger loads mean more economical hauling and better market prices.

In 1978 the Recycling Center marketed 416 tons of glass, 361 tons of newspapers, 151 tons of mixed paper (magazines, cartons, clean bags, etc), 68 tons of steel cans, four and one-half tons of aluminum, 2700 gallons of waste oil, and 20 tons of scrap metal -- altogether over 5,000 cubic yards of materials.

In each of the last three years, the non-profit Recycling Center has grossed about \$23,000 annually. Ninety percent of the income goes back into operating the Center. The remaining ten percent is donated

to various causes such as environmental education and the cancer and heart funds.

The City of Danbury leases the Center its land, near the town's landfill, for one dollar a year and every several weeks lends a front-end loader from the city's landfill for glass loading. The city also provides trash pickup -- even after recycling everything possible, there is some trash.

Of Danbury's recycling program Cusack says, "We're increasing our use year by year." He estimates that about twenty percent of Danbury's 60,000 citizens now make use of the Center, but worries that eighty percent still don't. He notes that the Center is located conveniently close to a shopping center. "We've put in lights so people can bring their recyclable items at night on their way to the movies in the shopping area. And we're open on Sundays, when we pay a kid ten dollars to supervise the Center."

Working up to its current levels, Cusack says, was "Something we had to learn by doing."

## SCRAP METAL



*Fluctuating markets in recyclable materials are a continuing problem. At the current 20¢ a pound for scrap metals, for example, hauling this refrigerator would cost more than the price it would command.*



## MUNICIPAL RECYCLING PROGRAMS:

# "The level of participation is what amazed us."

Municipal-level programs may offer the greatest potential for encouraging widespread recycling.

East Lyme is one town that already has gone into recycling at "curbside" level. As one East Lyme sanitation crew picks up garbage, a second covers the same area picking up, in its truck, a "dirty mixture" of bottles and cans and, in the truck's trailer, separated clean papers and cardboard.

"The level of participation is what amazed us more than anything else," says Public Works Department Administrative Assistant Bill Malcolm. East Lyme, Malcolm says, has an ordinance requiring separation at the source, but the ordinance is not actively enforced. He credits a good public relations program with what he estimates as "about 100 percent participation."

Town senior citizens put together the wired brochures which sanitation crews attach to trash cans or hang on the doors of new residents. These tell people how to use the service and let them know their collection days. Residents are also given orange stickers to mark the cans that hold their cans and bottles. The brochure also goes to new residents via the Welcome Wagon.

The curbside service, Malcolm says, took regular sanitation personnel for the separate crews -- meaning no increase in manpower. Initial investment went for trailers (for papers and cardboard), hitches, and the addition of the trailers' wooden sides.

The bottle and can mixture goes to a bin in East Lyme's landfill. It's purchased by a private resource recovery firm in Branford -- which does the sorting needed to produce high profit "clean" loads of glass and metals. The paper and cardboard goes to another container at the landfill and is purchased by one of Connecticut's roughly thirty dealers in waste paper.

Malcolm thinks East Lyme's participation level is high not only because of good public relations but also because the level of separation required is easy to manage: "If we were to go further, with color separation, for example, we might have more problems. It may be better not to push the issue."

Glastonbury's recycling program is located in the town's landfill. It offers

separate containers for clear, green, and amber glass; aluminum cans; scrap metal; newspapers; cardboard; tires; and brush.

Right now, according to Ralph Mandeville, Glastonbury's Superintendent of Sanitation, cooperation of individuals is good, but the city's private contractors -- which handle eighty-five percent of the town's waste -- have no provision for separating out recyclable materials. The town, Mandeville says, plans to make recycling mandatory this spring, which may create problems for the haulers.

Glastonbury pulled 163 tons of recyclables out of the "waste stream" in November 1978 -- 83 tons of this total in "bulky wastes." Of the other 80 tons, 50 tons were collected at four satellite recycling stations at local markets and gas stations.



Over the past two years, Mandeville says, Glastonbury has added two staff members, three-quarters of whose time is chargeable to the recycling program. Total landfill operating costs have risen by \$14,000 between fiscal 1977 and the current year, while this year's gross recycling revenues are expected to exceed fiscal 1977 revenues by \$18,000. These figures don't include, Mandeville says, the savings that could be credited to the removal of an annual 1,000 tons of recyclables (not counting the bulky items) from the waste stream.

Mandeville estimates that sixteen to eighteen percent of the community's citizens are participating in the recycling program which removes three to five percent of total wastes -- close to the three-to-six percent "best you can expect," of a voluntary program by EPA estimates, he says.

# Top HUD project interprets environment for developers

*By Richard Hyde, Principal Environmental Analyst, DEP Natural Resources Center.*

Connecticut's two Environmental Review Teams, operated through the Eastern Connecticut and the King's Mark Resource Conservation and Development (RC&D) Areas, have just completed a busy year with a combined total of fifty-seven land use site reviews.

This year, the two Connecticut Environmental Review Teams were chosen as one of the top two HUD-funded projects out of four hundred conducted between 1971 and 1976. The Environmental Review Team was identified as a project that not only resulted in considerable success in the State of Connecticut where it was implemented but also achieved a high score for transferability to other states in the study done for HUD by the American Institute of Planners (AIP) and the International City Management Association (ICMA).

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## Subdivisions were designed without adequate consideration of areas' natural qualities . . .

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The ERT was conceived by the Eastern Connecticut RC&D in 1969 in response to problems presented by increasing numbers of residential subdivisions. Subdivisions were being designed and approved without adequate consideration of the natural environment, resulting in problems with sewage disposal, water supply and drainage, and overall loss of natural qualities that contribute to an area's attractiveness.

The service really began becoming effective in 1973 when the New England Regional Commission, through a demonstration grant to the Southeastern Connecticut Regional Planning Agency, provided for the first full-time coordinator. In fiscal 1975, funding was received from the U.S. Economic Development Administration through a technical grant to the Eastern Connecticut Development Council.

In December 1975, a special one-year Innovative Projects Grant was received from the U.S. Department of Housing and Urban Development to fund the ERT in Eastern Connecticut, to start up a new team in the King's Mark Area in Western Connecticut, and to develop a manual on the ERT concept to be distributed nationally by HUD. The HUD grant ended in February 1977, and State funding began in October of 1977. With the

State funding, each team is provided with a full-time coordinator and necessary clerical, printing, communications, and travel support.

The purpose of an Environmental Review Team (ERT) is to provide local decision makers and developers with natural resource data and interpretation which will foster environmental quality and improve the long-term economics of land use. The unique aspect in the evolution of the ERT has been the cooperation among different agencies at various levels of government. Initially brought together under the umbrella framework of the Eastern Connecticut Resources Conservation and Development (RC&D) Area and subsequently under the King's Mark Area, participating agencies have provided staff time to the RC&D committees which developed the team concept and procedures, as well as technical staff for the actual reviews.

Principal participating agencies are the United States Department of Agriculture Soil Conservation Service (SCS), Soil and Water Conservation Districts, University of Connecticut Cooperative Extension Service, Connecticut Departments of Environmental Protection and Health, and ten regional planning agencies.

The ERT consists of professionals covering a wide range of disciplines within the fields of natural resources, engineering, and planning. Following a request by a town and developer, the ERT conducts an on-site study of the proposed development. The distribution, quantity, and quality of the natural resources on the site and in the surrounding area are evaluated by each discipline with respect to their ability to support the proposed development and the probable effects of the development on the natural resources. Final ERT reports present only factual information highlighting potential problems, limitations, alternatives, opportunities, and areas of possible trade-off. The ERT does not act as an advocate of one point of view or another, but rather strives for balance and objectivity.

Connecticut's ERT's act only in an advisory capacity, with decisions being made by the town and the landowner or developer. The ERT's do not compete with private consultants by providing finished site plans. Rather their function is to represent the public interest by indicating the need for and the advantages of applying sound conservation principles to a development.



Part of the attractiveness of an ERT is its utilization of area personnel. Though this represents a cost to the participating agencies, it provides a long-term benefit to the area and the agencies. This advice of a preventative nature early in the design process may make it possible to avoid long-term, costly corrective or regulatory problems in the future.

The benefit accrues to both the developer and the general public. The developer, particularly when assisted during the early stage of a project, may avoid expensive mistakes if he is made aware of a site's limitations and can incorporate alternative solutions and prevention and control measures into site plans. He is much more likely to include a team's recommendations in site plans and designs if he is assisted early, before he spends much money.

Proper planning and construction mean the general public, as homeowners and as taxpayers, will be spared the costs for improvements and corrective measures for items such as septic failures, sewer and water line construction, flood control, storm drainage, road maintenance, and erosion and sedimentation control. Neither financially stressed towns nor taxpayers, for example, want to incur the costs of constructing, maintaining, and operating a sewage treatment plant to correct an improper development.

Many major town-initiated land development proposals may be partially funded through various state and federal programs

seven towns outside the RC&D area in Tolland County on a priority basis. The scope of ERT activities has broadened with experience to include many types of land use proposals. Beginning with subdivision reviews in 1969 and 1970, the ERT soon realized that the needs of the towns and developers extended to other types of land uses. In response, the ERT expanded its scope to include commercial, industrial, open space, recreation, conservation, and public facility projects.

Part of this change was also due to the changing economy, which decreased housing construction. Most towns in the ERT area have experienced declining housing starts in the 1970's compared to the middle 1960's. From 1974 through 1978 about seventy-five percent of the reviews in eastern Connecticut were residential projects. Other land use proposals have added interest to the reviews by presenting a range of problems and opportunities for the team members. The Eastern Connecticut ERT has recently undertaken several lake watershed studies and natural resource inventories in addition to the typical projects previously undertaken.

The ERT in Western Connecticut was established in December 1975, and serves the forty-seven towns in the King's Mark RC&D Area. The King's Mark reviews have covered a variety of land use proposals such as a lake eutrophication study, a natural resource inventory and management study, a natural resource inventory along a proposed limited access highway, and a public water supply watershed study.

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## **ERT advice can help avoid costly corrective or regulatory problems . . . early assistance means site recommendations are more likely to be used.**

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promoting industrial development, the purchase of recreational/open space lands, the placement and operation of sanitary landfill sites, and the establishment of low-income and elderly housing complexes. Towns are required to supply certain technical and environmental impact assessment information about the site proposal to the funding agency. In Connecticut, this presents a problem to many towns operating on low budgets with minimum, if any, technical staff capable of completing environmental assessment portions of funding applications. The ERT's have directly benefited these towns by producing natural resource information reports needed to prepare state and federal funding applications.

The ERT in Eastern Connecticut serves the fifty-seven towns in the RC&D area and

Both teams now try to provide free service to all of the towns in the state within their capabilities and a priority system for accepting site reviews.

The key personnel provided by participating agencies under RC&D programs in Connecticut include:

USDA Soil Conservation Service District Conservationist, Soil Scientist or Soil Conservationist, Engineering Specialist, and Biologist;

DEP Geologist/Hydrologist, Forester, Wildlife Biologist, Fish Biologist, Recreation Specialist, Marine Biologist, and Lake Ecologist/Limnologist;

Department of Health Sanitarian;

To p. 12.

# Nature Notes

by Penni Sharp

The winter season, with its cold and often inclement weather, is a time of stress for living things. Life's necessities, food, shelter, and water, are not so readily available as they are during the warm months of the growing season. Because of this, animals have evolved strategies which enable them to survive the rigors of winter.

Some escape winter altogether by seasonal migrations to warmer climates, while others escape by becoming dormant or hibernating. Many remain active throughout winter, adjusting their behavior to cope with the shorter days and freezing temperatures.

Certain habitats which are alive with animal activity in spring, summer, and fall seem barren and lifeless in winter. A pond, for example, teems with life from early spring on, yet during winter ice and snow cover its waters, and life appears to have ceased. What has become of the many creatures that visit its banks and dwell in its depths?

## Aquatic Habitats in Winter

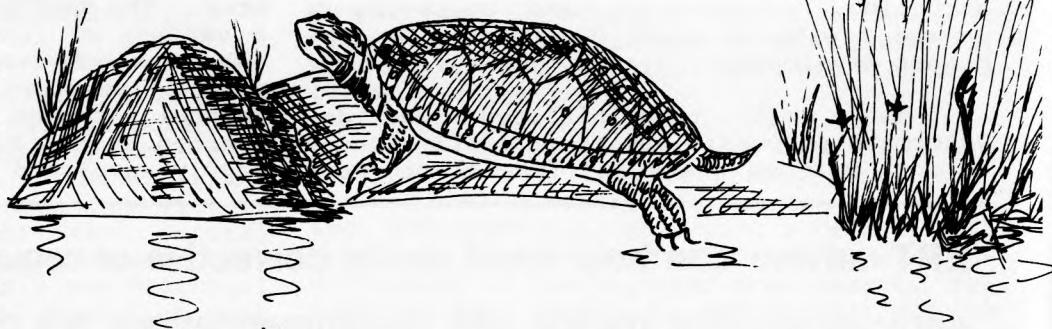
The unique properties of water make habitats such as lakes and ponds fascinating subjects of study even in the winter time when, to all appearances, little is happening. Water is a medium in which and upon which animals can move readily. Water contains dissolved gases such as oxygen and carbon dioxide that are necessary for the survival of plants and animals.

Another feature of water which makes it a desirable dwelling place is its relatively even temperature. Slow to warm during summer months, water cools evenly throughout the fall, thus its inhabitants are not sub-

ject to the drastic changes in temperature that can occur on land.

At a temperature of 0° Celsius (32°F), water freezes. Water, like most substances, contracts when it cools; however, when the temperature is between 4°C and 0°C, water expands. Water at this temperature is less dense and rises to the surface. Thus, ice floats and water freezes at the top rather than bottom of lakes and ponds. This property is critical to the survival of aquatic plants and animals during winter.

Differences in water temperature cause layering of water. In the spring and fall, large bodies of water are subject to "overturn" due to changes in the density of water at different temperatures and the circulation of water caused by wind. Cooling surface waters sink to the bottom during the fall, carrying along the microscopic animals that proliferate at the surface throughout the warm months.



In winter these tiny organisms remain at the bottom where temperature and oxygen levels are low. At the time of the spring overturn, the rising warmer water carries the animals upward toward the light and an increased oxygen supply. Small shallow ponds do not experience the overturn as heat from the sun is absorbed fairly uniformly throughout, thus, there is little water circulation except that caused by the wind.

During winter, oxygen ratios in lakes and ponds differ from their summer levels. At cooler temperatures, water has a greater capacity to hold oxygen. This fact is of obvious importance to the winter populations of aquatic habitats. Although at lower temperatures the metabolic rate of most animals is greatly reduced, all animals still depend upon an adequate amount of oxygen to sustain life.



# DEP Citizens' Bulletin Supplement

## Permits Issued

### Air Compliance

12/1/78: Carabetta Enterprises, Inc.,  
Waterbury  
Approved operation of a 150 H.P. boiler.

12/1/78: Union Carbide Corp., Danbury  
Approved construction for a boiler.

### Water Compliance

1/22/79: Housatonic Wire Co., Inc.,  
Seymour  
To discharge 45 gallons every three days  
of wire drawing soap to the sanitary  
sewerage system in the town of Seymour.  
Conditions.

1/22/79: Housatonic Wire Co. Inc.,  
Seymour  
To discharge 2,500 gallons per day of  
non-contact cooling water into Little  
River. Conditions.

1/22/79: Newington Children's Hospital,  
Newington  
To discharge wastewaters from photographic  
operations. Conditions.

1/22/79: Florence Mill Associates, Chest-  
nut Hill, Mass.  
To discharge 20,000 gallons per day of  
sanitary sewerage to the town of Vernon  
sanitary system. Conditions.

1/31/79: Olin Ski Company Inc., Middle-  
town  
To discharge 40,000 gallons per day into  
Sawmill Brook. Conditions.

1/31/79: The T.H. Russell Company, Inc.,  
West Hartford  
To discharge wastewaters from photographic  
processes. Conditions.

The following permits have been re-  
issued. Persons wishing to comment may do  
so by writing to the Director of Water Com-  
pliance.

A public hearing may be held if re-  
sponse to these notices indicates signifi-  
cant public interest.

Skinner Precision Industries, Inc., New  
Britain  
Permitted discharge consisting of treated  
metal finishing wastewaters. Conditions.  
Comments by March 7, 1979.

Glass Container Corporation, Dayville  
Permitted discharge consists of cooling  
water, treated glass house wastewaters,  
wet scrubber wastewaters, and storm runoff.  
Conditions. Comments by March 7, 1979.

Dow Chemical Co., Gales Ferry  
To discharge cooling water. Comments  
by March 2, 1979.

UOP/Aerospace Division, Bantam  
To discharge non-contact cooling water.  
To discharge cooling water and treated  
wastes from an electroplating operation.  
Conditions. Comments by March 20, 1979.

Keuffel and Esser Co., Lakeville  
To discharge uncontaminated, non-contact  
cooling water. Comments by March 20,  
1979.

The Torrington Co., Torrington  
Three permits to discharge non-contact  
cooling water. The Standard Plant dis-  
charges to the East Branch of the Nauga-  
tuck River. The Excelsior Plant discharges  
into the storm drainage system then into  
the East Branch of the Naugatuck River  
and the Broad Street Plant discharges  
to Gulf Stream. Comments by March 20,  
1979.

The Taylor and Fenn Co., Windsor  
A reissuance of an existing permit for  
a five-year period. The discharge is  
of uncontaminated, non-contact cooling  
water. Comments by March 20, 1979.

The Stanley Plating Co., Bristol  
A reissuance to discharge treated wastes  
from an electroplating operation. Con-  
ditions. Comments by March 20, 1979.

The Superior Electric Co., Bristol  
A reissuance of an existing permit for  
three discharges. Two are non-contact  
cooling water, the third is treated wastes  
from an electroplating operation. Con-  
ditions. Comments by March 20, 1979.

The Bass Plating Co., Bloomfield  
To discharge treated wastes from an  
electroplating operation. Comments by  
March 20, 1979.

United Technologies Corporation,  
Farmington  
A reissuance for two discharges of non-  
contact cooling waters from air condition-  
ing units. Comments by March 20, 1979.

Heublein, Inc., Hartford  
A reissuance to discharge non-contact  
cooling water from beverage bottling  
operation.

The Homer D. Bronson Co., Beacon Falls  
A reissuance to discharge treated wastes  
from an electroplating operation. Com-  
ments by March 20, 1979.

Peter Paul Cadbury, Inc.  
A reissuance to discharge uncontaminated,  
non-contact cooling water from refrigera-  
tion and air conditioning units. Comments  
by March 20, 1979.

Summit Finishing Division Kawecki-Berylco  
Industries, Inc., Thomaston  
To discharge treated wastes from an elec-  
troplating operation. Conditions. Com-  
ments by March 20, 1979.

Dooval Tool and Manufacturing Co.,  
Naugatuck  
To discharge uncontaminated, non-contact  
cooling water from a degreasing operation.  
Comments by March 20, 1979.

All-Brite Chemical Corporation, Watertown  
A reissuance to discharge treated wastes  
from an anodizing operation. Conditions.  
Comments by March 20, 1979.

### Structures & Dredging

1/16/79: John Russo, Trustee c/o Mark  
Yellin Esq., West Hartford  
To amend State Structures and Dredging  
Permit SD-76-134 to (1) change expiration  
date to January 2, 1982; (2) to modify  
the design and location of the disposal  
and temporary storage site for dredged  
materials; and (3) to establish a method  
to determine the amount of payment to  
the State for materials sold.

1/23/79: Pond Point Beach Association,  
Milford  
To construct three groins and four tire  
reefs at Pond Point Beach, Milford.  
Conditions.

1/30/79: Joseph S. Chernock, c/o Stephen  
E. Ronai, Esq.  
To retain and maintain an existing bulk-  
head, a ramp, a float, and four finger  
floats in Milford Harbor. Conditions.

2/2/79: Elliott Clarke, Old Lyme  
To retain and maintain a pile and timber  
pier, a ramp, a float 8' x 16', three  
floats 6' x 10', and six pipes to secure  
the floats in Hamburg Cove at Lyme. Con-  
ditions.

2/2/79: Fair Haven Marina, New Haven  
To retain and maintain existing marina  
facilities. Conditions.

### Encroachments

1/5/79: Morris Farms, Wethersfield.  
To place fill on property on Elm Street,  
Wethersfield, riverward of established  
stream channel encroachment lines for  
the Connecticut River.

### Dam Construction

1/22/79: The New Haven Water Co., New  
Haven  
To repair a dam on Maltby Lake No. 3 in  
the town of West Haven. Conditions.

### Legal Notice

The Connecticut Department of Trans-  
portation, Bureau of Highways has received  
from the Division Administrator of the  
Federal Highway Administration approval of  
the corridor, location, and design for the  
replacement of the bridge carrying Kennedy  
Road over the railroad in the town of  
Windsor. More detailed information is  
available at the D.O.T./Bureau of Highway  
Engineering Office, 160 Pascone Place  
Newington.



In the winter season, the oxygen supply is abundant near the surface and poor near the bottom. Under ice cover, the oxygen supply slowly dwindles due to the decomposition and decay of organic matter. If there is a combination of ice and snow cover, plants are unable to carry on photosynthesis and the oxygen supply is not replenished. The diminishing amount of dissolved oxygen is usually not too great a problem, however, and, in general, ponds and lakes can support life in winter as the temperatures beneath the ice remain above freezing, and a tolerable level of oxygen remains.

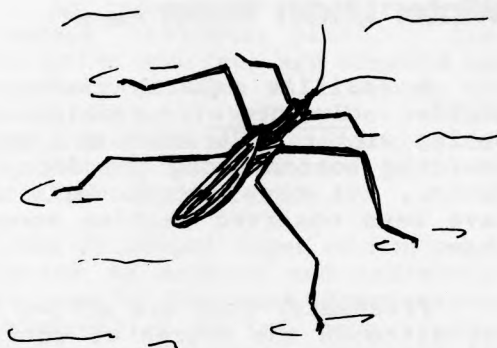
## Pond Animals in Winter

An observer of a pond in summer can see a broad representation of animals --reptiles, amphibians, mollusks, mammals, birds, fish, and insects can all be observed in and around ponds. By winter, few remain. Of the reptiles and amphibians, turtles and frogs head for the bottom of ponds as soon as the temperature begins to drop in the fall.

The green frog (*Rana clamitans*) and the bull frog (*Rana catesbeiana*) adults wedge themselves under stones and spend the winter hibernating with head bent and legs sprawled. The tadpoles of these two species burrow several inches into the muddy pond bottom and hibernate there until spring. During late summer, these amphibians have been active feeders, storing up fat to sustain them through winter. During hibernation, the rates of respiration and circulation are greatly slowed. Frogs remain dormant at temperatures below 10°C, but they have been observed swimming during the winter if the temperatures are above 10°C.

The painted turtle (*Chrysemis picta*), a common resident of Connecticut ponds, burrows into the mud at the bottom of ponds in the autumn, there to remain until spring. Although all turtles are air breathers, special adaptations enable them to live underwater during winter. Their need for oxygen is greatly reduced due to slowed metabolic rates.

Pond turtles are equipped with accessory bladders located on each



side of the urinary bladder. These accessory bladders fill with and empty of water bringing oxygen with each change of water. As the bladders are lined with blood vessels, oxygen can circulate throughout the turtle's body. Turtles, like frogs, remain dormant in our area until temperatures moderate around late March.

Insects constitute the greatest variety of animal life in a pond. There are literally hundreds of species of insects which spend all or part of their lives in aquatic habitats. Of these, many remain active, if somewhat sluggish, during winter.

Mayflies (*Ephemera*), damselflies, and dragonflies (*Odonata*) spend the greatest portion of their lives as nymphs in ponds and streams. During winter, the nymphs migrate towards the bottom. They continue to feed throughout winter, although their metabolism is lowered. Some species of dragonfly nymphs observed in captivity during winter failed to molt indicating a slow growth rate during this time. By contrast, some species of Mayfly nymph show increased metabolism during February. This late winter activity enables the nymphs to reach adulthood in time for the spring breeding season.



## Winter Under Water From p. 11

A familiar aquatic insect, the water strider (Hemiptera), remains semi-active during winter. Striders are usually found near the bottom among the decaying organic matter, but they occasionally surface and have been observed skating about during a thaw.

Freshwater fish are active during winter although the degree of activity varies among species. At the onset of winter in lakes and large ponds, fish migrate out to deeper waters. Some remain close to the bottom and seldom feed, while others swim about beneath the ice feeding regularly.

Ice-fishing on ponds and lakes usually results in a different catch than that of summer. Large-mouthed and small-mouthed bass (Micropterus salmoides and Micropterus dolomieu) which take bait readily in the summer are caught infrequently during winter. The species that are caught in winter are mainly the predacious fish such as

northern pike (Esox lucius) and yellow perch (Perca flavescens).

Even fish which feed throughout winter show slower rates of growth during winter months and are less active. Some, the common carp (Cyprinus carpio), for example, lie on or burrow in pond bottoms and feed little, if at all.

The muskrat (Ondatra zibethica) is a mammal that is often found inhabiting ponds. This water dwelling rodent is active throughout the winter, feeding on roots and stems of cat-tails and other aquatic plants. Muskrats construct elaborate "houses" -- domes of mud thatched with cat-tails or phragmites. Their houses are usually several feet from the shore and the muskrats must dive under water in order to enter these structures. In severe winters, if ponds are frozen throughout, muskrats may become trapped inside their houses.

Although all appears still under the water cover of ice, life in a pond continues in spite of the cold. Activity, perhaps at a minimum, still occurs.

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## Teams Assess Development From p. 9

Cooperative Extension Service, Climatologist/Environmentalist, Landscape Architect, Agricultural Extension Agent, and Community Facilities Development Agent; and

Regional Planning Agencies' Community Planners.

Depending on the nature of the review and the requirements of the site, various technical personnel are added as needed. For example, the Department of Transportation has on occasion provided a transportation planner, the Department of Commerce an economist, the Department of Environmental Protection a sanitary engineer, the Agricultural Experiment Station a limnologist, and the American Indian Archeological Institute and Connecticut Historical Society, an archeologist. The Cooperative Extension Service also can supply additional specialists if needed.

### Request Procedure


The procedure adopted by both ERT's for conducting reviews has some aspects peculiar to the State and the relationships existing among agencies. However, the process as a whole is based on the cooperation and involvement of all parties: the town, the owner and/or developer, and the team participants.

The first step in a review is in the form of a formal letter of request from the town to the applicable County Soil and Water Conservation District. This serves two purposes: first, County Soil and Water Conservation District Board members often have insight into local projects and how the team may or may not be able to assist, thus performing a screening function; and second, their referral of the proposed project is a requirement of the RC&D bylaws for participation by Soil Conservation Service personnel. The Board evaluates the request in terms of complexity, size, scope of services needed, and priority. The Board may elect to handle the project "in house" if a full team is not warranted to solve a particular problem.

The letter of request should consist of a statement concerning the intended use of the land and areas of concern; permission to enter the property; a location map; and a surveyed plot plan/site plan (if available). Permission to conduct the study is required from both the land owner and the developer. It is most beneficial if the local commission(s) having some authority over the project are involved.

In some cases the municipal chief executive officer makes the formal request. Upon recommendation by the Board as an ERT project, the request is forwarded to the appropriate RC&D Executive Committee for final approval. Once a review request is approved by the RC&D Executive Council it can be scheduled for a field review.





# 208

## WATER QUALITY MANAGEMENT

209 COURT ST., MIDDLETOWN, CT. 06457 347-3700

By Joseph M. Rinaldi, 208 Public Participation Assistant

### "208" Sets 1979 Work Plans

The Connecticut 208 Program has begun its work program for Fiscal Year 1979. This year's efforts build upon the work completed in 1978, which was primarily data gathering. Several water quality problem areas which were highlighted last year will receive special attention in 1979.

One of the most important tasks this year is aquifer protection. Aquifers are underground beds or strata of earth, gravel, or porous stone that contain water. Last year the United States Geological Survey (USGS) mapped the major stratified drift aquifers in Connecticut. These are sand and gravel deposits known or inferred to be saturated with enough water to serve as major, future public water supplies. A delineation will be made of those aquifers deemed critical for future water supply. The regional planning agencies will then work with their member towns to develop land use regulations to protect these aquifers.

A second major work element of this year's 208 Program is to assist towns in the implementation of the Sewer Avoidance Program (SAP), which was recently adopted by the Connecticut General Assembly. Under this program, communities may develop alternate strategies to control pollution without having to construct costly, conventional sewers and sewage treatment plants. The regional planning agencies, with 208 funds, will assist in the establishment of a Water Pollution Control Authority and preparation of an Executive Water Pollution Control Plan, both of which are requirements for participation in the SAP. Presently, no other source of funding exists to help underwrite these efforts.

Another major task is to assess the impact of non-point sources of pollution on selected watersheds in the State. Non-point sources of pollution are those which do not originate from a specific outlet or point. Some examples are urban and agricultural runoff (stormwater carrying contaminants), failing septic systems, leachate from land-

fills, etc. As industrial discharges and municipal sewage treatment plant discharges (both point sources) are cleaned up, non-point source pollution will become the primary cause of water pollution. This assessment will produce a first-cut evaluation to help determine how these problems can be controlled in the future.

One of the principal types of non-point source pollution is erosion and sedimentation. Last year's 208 work demonstrated that many communities do not have erosion and sedimentation regulations, and that few of those which do actually enforce them. Therefore, the regional planning agencies will help local communities design effective erosion and sedimentation control programs and work with towns in implementing the programs once developed.

As part of the overall non-point source assessment the State Forester will investigate the effects of silvicultural practices in Connecticut as they relate to soil loss. An inventory of current logging operations will be conducted, and best management practices to minimize erosion will be developed.

One of the most important sections of the work program will involve industrial wastes. In 1978, an inventory was completed of industrial sludge generation and disposal in the Greater Bridgeport, Waterbury and Hartford areas. The inventory demonstrated that industrial waste disposal is one of the most pressing economic and environmental problems in Connecticut. As part of the overall solution to the problem, the 208 Program has contracted with The Research Corporation of New England (TRC) to conduct a feasibility study to expedite the planning and construction of a facility for the processing, treatment, and disposal of hazardous industrial wastes. A Task Force has been created to assist the project which comprises government, industry, citizen and environmental groups.

Another area of the 208 work plan deals with evaluating local, regional, State and federal water pollution control regulations. Utilizing the 1978 management outputs, an in-depth assessment will be made of the total infrastructure for water quality management in Connecticut. Recommendations will be made to streamline or condense controls wherever possible to result in improved protection of the State's natural resources while making government regulations less burdensome to the public.

When septic tanks are pumped the concentrated sludge, known as septage, must be disposed of. Similarly, municipal sewage treatment plants also produce a sludge which needs disposal. A statewide assessment of

## ***What the Sea Giveth, the Sea Taketh Away***

*David Tedone, Public Participation Assistant*

It's fashionable these days to talk about erosion of the dollar, and at the risk of making an awkward pun, it's double jeopardy to spend those dollars trying to combat shoreline erosion. The fact is a lot of money is spent each year fighting the steady erosion of Connecticut's coastline. And to date no method has proved entirely successful.

Some Connecticut beaches may lose one and one-half feet of land each year to the waters of Long Island Sound. Millions of dollars have been spent by federal, state, and local agencies, and by individual property owners, in attempts to protect the

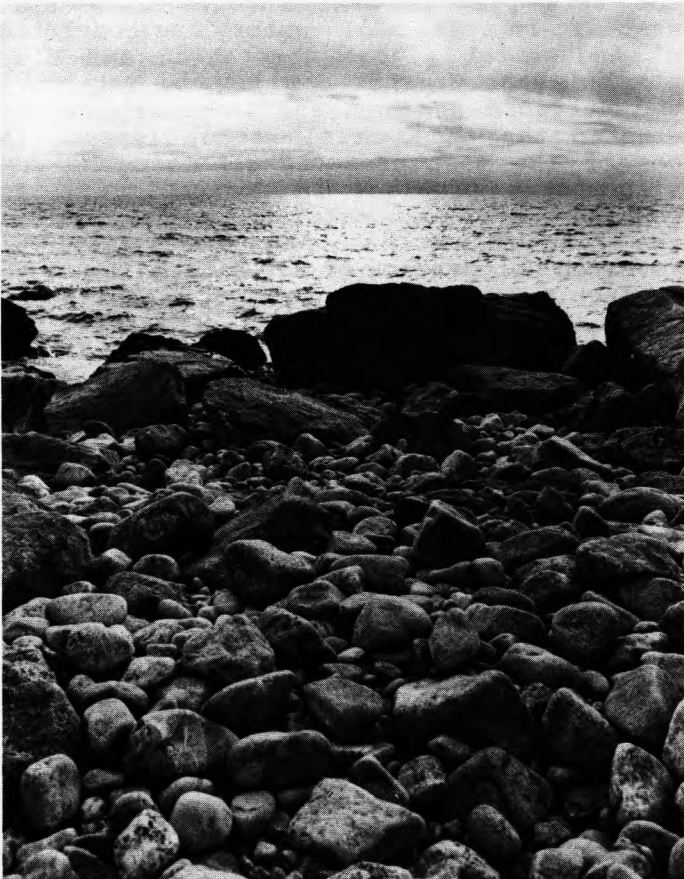
shoreline and prevent erosion. Nonetheless, Connecticut's coastline continues to erode. This steady recession inevitably threatens the stability of all manmade structures built nearby. Because a major portion of our shoreline is highly developed, we become particularly prone to the hazards of shoreline erosion, the loss of recreational opportunities, and the risk of high financial loss.

Erosion is a natural process which occurs worldwide. It represents one phase of the "erosion-sedimentation" process -- which simply means that material taken from one place is deposited in another. Shorelines are said to be in a state of "dynamic equilibrium" or, simply, in a state of constant change and adjustment. Beaches are eroded and beaches are created. What the sea giveth, the sea taketh away.

Waves from Long Island Sound, especially steep plunging waves kicked up by storms, are the primary cause of erosion along Connecticut's coastline. Waves break onto the shore, displacing sand, soil, and rocks, and carry off sediment. On several areas of Connecticut's shore, waves have removed all sand and soil and left exposed bedrock shorefront.

Longshore currents play an important part in the erosion-sedimentation process. If wave currents tend to run east to west along a shoreline, then materials either drawn off the shore by plunging waves or directly exposed to the current will be swept westward. As a result, some exposed areas may be left barren, while other protected areas are built up by the addition of the displaced materials.

A third factor contributing to shorefront erosion is the steady rise in sea level. For many centuries the earth has been warming and its ice caps melting. The net result is that sea level has risen at the rate of one foot per century. On the surface, this may not seem very much, but when sea level rises one foot against a slightly sloping shore, say against a beach with a twenty degree angle, then approximately twenty feet of shorefront will be



*The rocky shorefront shown here was once covered with topsoil and grass. Over the years waves eroded the soil and are now at work on the rocks.*





*Waves tend to plunge onto the beach and drag off sediments.*

covered by water. Virtually nothing can be done to thwart this worldwide natural phenomenon.

Groins and bulkheads are the most common means of challenging erosion. Groins are constructed by laying granite blocks, or other bulky material, in a strip that is perpendicular to shore. They act as barriers to longshore currents by trapping the sediment that is swept along shore. However, an uneven beach often results. The side of the groin that faces the current (the updrift side) will build a beach, while the other side (the downdrift side) will continue to erode. And once the groin has trapped its capacity of sediment, the erosion will resume at a steady rate.

Groins afford little protection from waves, and none from rising sea level. Bulkheads or sea walls offer some protection from waves, and at best temporary protection from rising sea levels. They are constructed in a number of ways: by pouring concrete, piling rocks, and driving piles and timber. Such walls tend to limit access to the shorefront, are aesthetically unpleasing, demand constant care and maintenance, and are prone to destruction. One strong storm can literally destroy a wall.

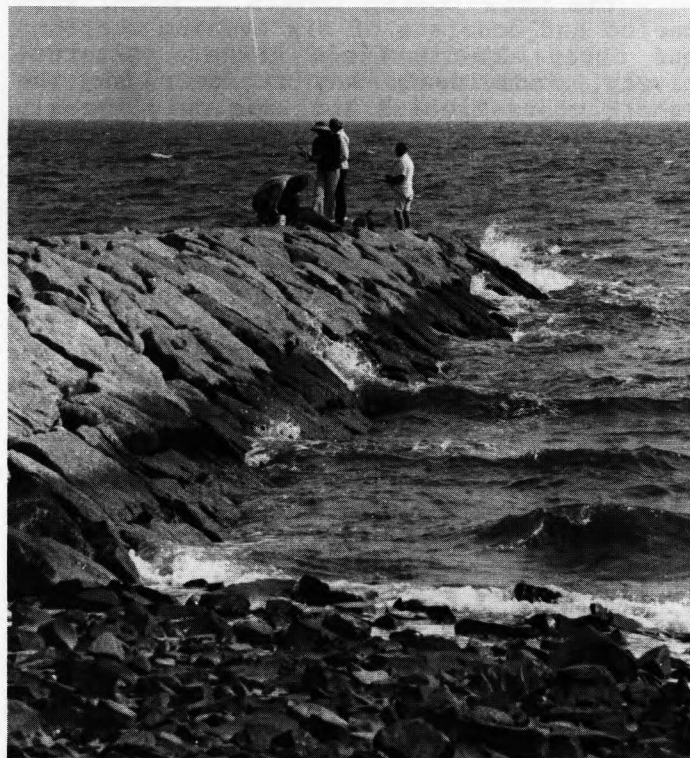
The problem posed by natural erosion is manmade. Erosion threatens us only because we have unwittingly built houses, piers, and roads close to the sea. We can't effectively stave off the sea with a few groins and bulkheads. Such attempts at erosion

control are only temporarily effective. We need to recognize the inevitability of natural forces, the unalterable force of erosion, and take account of our present methods of erosion management. Otherwise, we will continue to spend millions of dollars fighting a manmade foe, and still come up the loser.

The Coastal Management Program is working on a statewide policy for erosion control along our coast -- a policy aimed at coordinating erosion projects and attaining the maximum degree of effectiveness. Because a statewide perspective on erosion-related problems and solutions does not now exist for Connecticut, the creation of a planning process for assessing erosion, to ensure the coordination of publicly-funded efforts, is the logical first step. Using research and scientific data, CAM is identifying on a case-by-case basis the rate of erosion and its cause in Connecticut, and will analyze the alternatives for effective long-term management. Because the problem is complex, and because many erosion control projects for the state have proved either unsuccessful or temporary in the past, it would be wise to establish a statewide policy for choosing the most effective means of erosion control.

*For further information on natural phenomena related to erosion, see Long Island Sound: An Atlas of Natural Resources. If you don't have one, write us.*

*Groins are expensive to build and may provide only local and temporary protection from beach erosion. Note the absence of beach on the updrift side of the groin.*



# For Your Information



By Ellen Frye,  
Citizen Participation Coordinator

## Seminar on Land Use Decisions Scheduled in New Haven, Waterbury

Comprehensive land use seminar series for local decision makers will be offered this spring in New Haven and Waterbury beginning April 3 and 4. The series was initiated two years ago by DEP in cooperation with the University of Connecticut Cooperative Extension Service. The focus will be on the municipal land use decision making process, specifically the practical concerns of meshing legalities with local resource considerations.

The full course covers a seven week period and consists of six evening sessions and three all-day field trips. Alternatively, individuals may register for the "short course" which includes only the six evening sessions. Participants completing the full course will receive certificates of completion and three continuing education credits from the University of Connecticut.

Instructors are from a variety of agencies including the DEP, the University of Connecticut, the Soil Conservation Service, the legal profession, the Health Department, regional planning agencies, and municipal government.

The first evening session addresses the "Municipal Land Use Decision Process." Discussion will center on formulating and maintaining town plans of development, zoning maps, ordinances, and regulations. Local decision making processes and related frustrations will be identified.

The second session will look closely at the town's natural resource base. This will involve discussion and illustrations of the various natural resource systems, their in-

fluence on one another, and the problem of political boundaries versus natural boundaries.

The third session combines information from the first and third sessions to evaluate a hypothetical subdivision proposal. It will explore: how to determine the types of development a specific site will support and the possibilities of determining off-site environmental impacts.

Legalities of land use decision making will be the theme of session four. Attorney Thomas P. Byrne will discuss planning and zoning matters. Professor Terry Tondro of the University of Connecticut Law School will cover other legal tools available for implementing environmentally sound decisions.

Participants will be asked to provide the teaching staff with case examples of current or past concerns in their towns. Cases will be selected and analysed by the staff for presentation and general discussion at the fifth session.

The final evening session will focus on federal and state regulations and programs. The areas of air pollution and energy conservation will be the major topics due to their current importance to all citizens. The session will be geared to applications in local decision making.

The first field trip is on "Earth Materials Use Capabilities." A geologist,



Deborah Dumin

Municipal officials look on as Soil Conservationist Phil Morneault demonstrates soil characteristics; part of an on-site review of a hypothetical subdivision during a fall 1977 "Field Trip III."



soils scientist, and sanitary engineers will take part in the discussion and observations of various soils and geologic situations and their capacities with regard to on-site sewage disposal, site development, and erosion and sedimentation control practices.

The second field demonstration is a bus tour of a major river basin to observe the natural resources systems and their use and interaction with various human activities (i.e., sewage treatment plants, sanitary landfills, flood control projects, ground water development).

The final field trip will draw upon all of the previous sessions by going through the entire process of receiving, discussing, on-site reviewing, and approaching a decision on an actual subdivision proposal. The process of making the decision and the town/developer dialogue will be acted out by participants and instructors.

Participants may register for either Tuesday night sessions at the New Haven Agricultural Experiment Station at 123 Huntington Street, New Haven, or Wednesday sessions at the Silas Bronson Library Auditorium, 267 Grand Street, Waterbury. Since the same evening sessions run at two locations, back-to-back, participants may attend on the alternate night if they experience conflicts.

The first five sessions will be held Tuesdays, April 3 through May 1, from 7:30 to 10 p.m. in New Haven and repeated from 7:30 to 10 p.m. on Wednesdays, April 4 through May 2, in Waterbury.

A single combined sixth session will be held Monday, May 7, 7:30 to 10 p.m., at the New Haven Agricultural Experiment Station. The three 9 a.m. to 4 p.m. Saturday field trips will be held on April 21, May 5, and May 19.

Local officials and local commissions will be contacted by mail. For further information, contact Martina Delaney at 566-3489.

## **Workshop on Natural Resources Data**

DEP and the University of Connecticut Cooperative Extension Service will present a special workshop for new members of local land use commissions and agencies on March 26 at the New Haven Agricultural Experiment Station, 123 Huntington Street.

The workshop will offer background information on the natural resource data base -- how to use it and how it can be applied in the land use decision making process.

It will stress reading and working with topographic maps to develop a basis for understanding site plans and eventually for developing single resource factor overlay maps. Participants will also get introductory information on using soil surveys.

This workshop is designed to serve as a useful background for the Land Use Decision Making Seminar described above. For more information, contact Martina Delaney, 566-3489.

## **New Directories List Environmental Organizations and Sportmen's Clubs**

The Department has recently published two new directories: the Connecticut Directory of Environmental Organizations and Connecticut Sportsmen's Clubs and Associations.

The environmental organizations directory includes names, addresses, and phone numbers for such groups as statewide and regional environmental organizations, land trusts, and nature centers. Sublistings for some categories--including "Connecticut Land Conservation Trusts," "Nature Centers and Junior Museums," and "Statewide and Local Conservation and Environmental Groups"--can be obtained in lieu of the entire directory.

The sportsmen's directory, published in cooperation with the Connecticut Sportsmen's Alliance, lists 344 such groups in the State.

Both directories and sublistings are available from DEP's Information and Education Unit, Rm. 112, State Office Building, Hartford, CT 06115.

## **P.A.C.E. Tours Solar Homes**

The Farmington Valley Chapter of P.A.C.E. (People's Action for Clean Energy) announces their Third Annual Alternative Energy Tour. Four energy-conserving homes that use passive or active solar systems or combinations of these will be open from 12 noon to 5 p.m. for those on the Saturday, March 3 tour. The homes are located in East Granby, Canton, and Burlington.

Tickets are actually brochures with home descriptions and a map. They are available for \$3 each from P.A.C.E., West Road, New Hartford 06057. For further information, call 693-2575.

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# LAND TRUST ISSUES

by Jack Gunther,  
Land Trust Service Bureau

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## Easements: Conservation Potential

All local land trusts and conservation commissions should become familiar with the tremendous advantages easements can provide for a land trust or town as well as for the donor of the easement.

When the owner of land donates a conservation (open space) easement in perpetuity to a land trust or conservation commission, the owner is thereby assured that the land will always remain as open space free from development, and that the natural beauty of the land will be preserved. The donor of the easement continues to own the land which may be sold subject to the terms of the easement.

When a landowner gives a trust or town an open space easement in perpetuity on a potential building site, the landowner is entitled to substantial federal income tax and local real estate tax benefits. The bulk of the economic value of land lies in its use as a building site, and by donating the easement, the owner gives up the right

to build. The remaining value of the land as open space is only a small percentage of its value as a building site. Under Revenue Ruling 73-339, the amount of the federal income tax deduction is measured by the difference between the value of the land before the granting of the easement (building site) and its value after the easement has been granted (open space).

The assessed value of the land covered by the easement for real estate tax purposes should be reduced to reflect the substantial diminution in the value of the land resulting from the restriction on building. The remaining use of the land as open space does not involve any costly drain on town services, and open spaces have a beneficial effect on property values by maintaining environmental quality.

The advantages of an open space easement are that the donor of the easement continues to own the land without any question of public access, and the donor retains the right to maintain the land consistent with the provisions of the easement. The land trust or town does not become involved with any potential maintenance expense or increase in exposure to public liability suits.

As a concrete example, recently an easement was given on a one-acre building site which was valued at \$70,000 before the grant and \$10,000 after the grant as open space, giving the landowner a federal income tax deduction of \$60,000. The assessed value for real estate tax purposes was commensurately reduced.

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## 208's 1979 Workplan From p. 13

septic and sewage sludge disposal practices will be conducted to determine their possible impact on groundwater quality and to determine if present disposal techniques are adequate. A design manual will be produced which will include specifications for proper siting, monitoring, operation and maintenance of disposal cells. The manual will be available for local authorities.

Landfills are a necessary evil in a consumption-oriented society such as ours. But many people never consider solid waste to be a water quality problem. When rainwater percolates through solid waste it extracts dissolved or suspended materials from it. The resulting liquid, called leachate, can pollute surface and groundwater. Using existing information, the 208 Program is assessing the probable impact of landfill leachate and runoff on Connecticut's surface waters and groundwater. Also, techniques for controlling or treating

landfill leachate and runoff pertinent to the geologic and hydrologic setting of Connecticut will be identified and their applicability discussed.

Finally, the 208 Program will continue to utilize extensive public participation techniques to insure that planning results can be implemented, and that the people of Connecticut will have a hand in curbing pollution.

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## Lifeguard Application Date Extended

Applications for the 167 summer lifeguard jobs in State parks may be submitted any time between now and the end of the summer. They must be in writing. The free folder, "State Lifeguard Programs," contains a 1979 application blank. Write or phone for a copy: Parks & Recreation, 165 Capitol Avenue, Hartford, CT 06115; phone: 566-2304.



# Water Resources Summary, 1978

## Streamflow

The 1978 calendar year began with excessive streamflow conditions during January, but during the remainder of the year flow was consistently monitored to be within the normal range for each month except November, when flow dipped below normal.

## Groundwater

Groundwater levels for the year were generally above average and in the normal to high range until October when they went below average, with the western half of Connecticut being mostly below normal and the eastern half in the normal range, due to below normal rainfall during the fall.

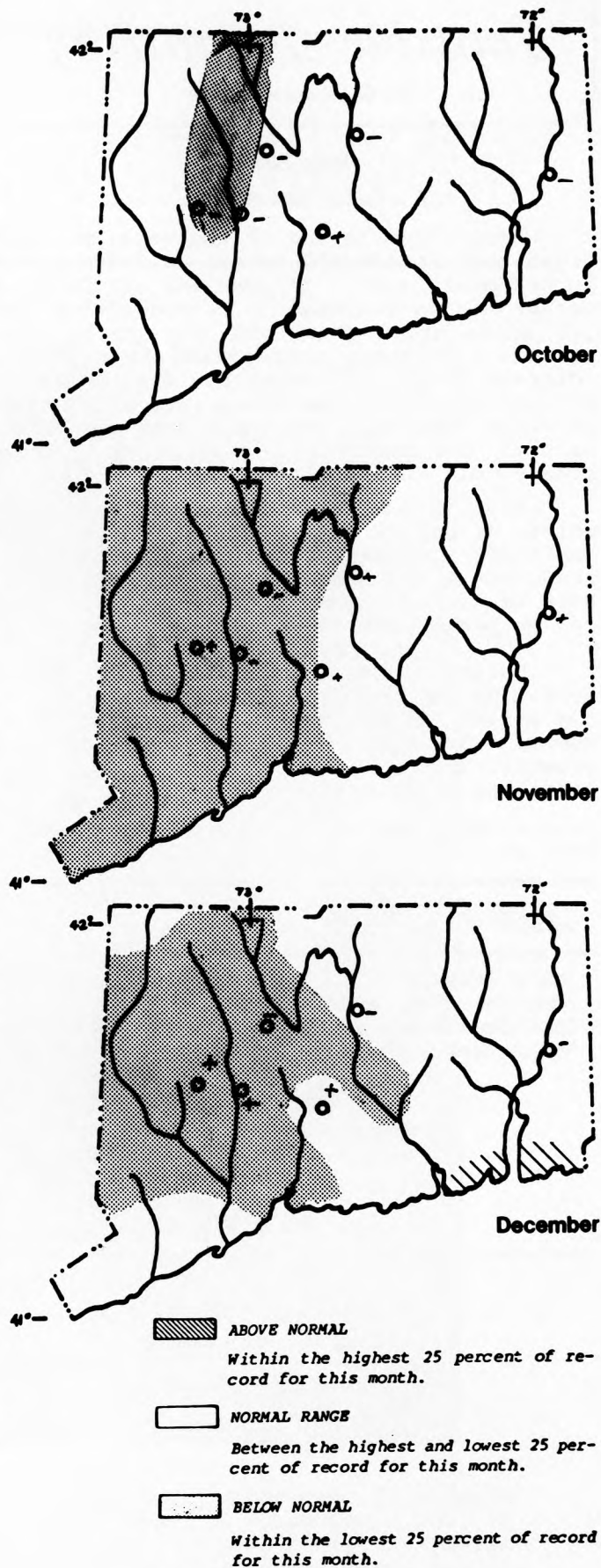
The Department of Environmental Protection, through a cooperative program with the United States Geological Survey, Water Resources Division, monitors streamflow and water quality in Connecticut's rivers and watercourses and maintains a regional groundwater level monitoring well network. The purposes of these programs are to better understand existing and historical conditions of streamflow, water quality, and groundwater levels in order to make more informed day-to-day water management decisions. The resulting information is used for assessing current water availability; for the management of water quality; for the forecast of water hazards; and for the surveillance necessary to comply with the legal requirements.

Streamflow records form the principal basis for the planning and design of water-related facilities. Past hydrologic experience, however, is never precisely duplicated: the exact sequence of wet and dry years probably will not occur again. For this reason, designers and planners commonly utilize statistical characteristics of streamflow rather than the records of flow at specific times. It is assumed that statistical parameters in the future can be approximated from the frequency of such occurrences in the past. Typical statistical characteristics are the mean flow, the flow of 50-year recurrence interval, and the standard deviation of annual mean flow.

A long record of streamflow at the specific site is desirable for defining statistical characteristics of streamflow at that site.

- + Water level rose since last month.
- Water level fell since last month.

Map based on 6 long-term observation wells (with at least 20 years of record) and 5 others. Elsewhere conditions are generalized.



Fourth Quarter, 1978

# Trailside Botanizing

by G. Winston Carter

## Gray Birch

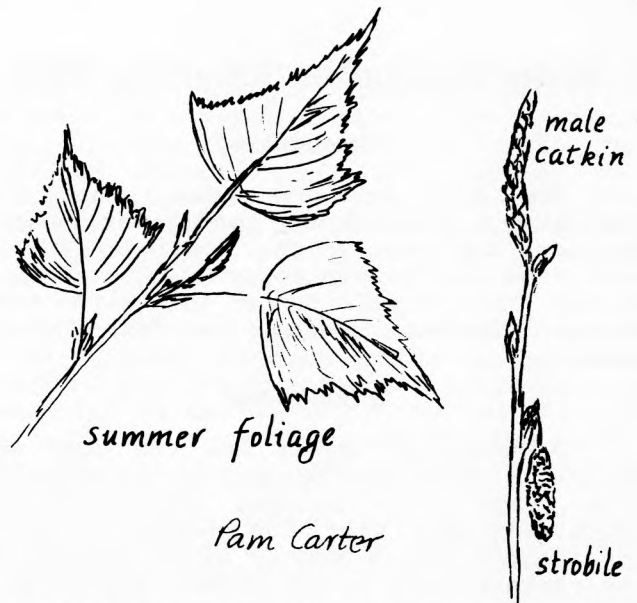
*Betula populifolia*

Gray birch is one of the early pioneer trees that invade old fields or cut-over or burned-over land. It becomes established rather easily because it is sun-loving and its seeds are lightweight and easily dispersed. In time, competition from shade-tolerant trees will cause the disappearance of the birch and the appearance of species of trees that will become a more permanent part of the forest. A gray birch is considered old when it is forty.

Gray birch is sometimes confused with white, or paper, birch. Its bark is silvery and tight with many conspicuous black chevrons, where old limbs have broken off. The bark of the white birch is snowy white and can be peeled off in wide strips.

During the winter months many specimens will be bent over, perhaps because of the weight of snow or ice or the inroads of decay. Occasionally, birch conks (fungus growths) may appear on some of the birch, hastening the process of decay.

Birches are one group of trees that have male catkins present in the winter.



They appear naked during the cold months and expand in early spring when, or in some cases before, the leaves appear. In gray birch, there is usually only a single slender, erect catkin. Other birches in this area have male catkins in twos or threes. The drooping female cone "strobile" develops during the spring and disintegrates during the summer.

Gray birch wood is rather soft and not very durable; however, it has a number of uses. It can be burned as fuel or can be made into charcoal or used in the making of small wooden ware. The seeds and buds are eaten by ruffed grouse and a number of songbirds. The twigs are food for the white-tailed deer.

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## DEP citizens' bulletin

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